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| CH2M HILL Hanford Group, Inc. | Manual | Management Plan |
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This document establishes a chronic beryllium disease prevention program (hereinafter referred to as the beryllium program) based on [10 CFR 850](#) and has been developed to meet contractor requirements for work performed by the Tank Farm Contractor (TFC) under contract to the U.S. Department of Energy (DOE). This plan has been developed to ensure consistency with the Hanford Site Chronic Beryllium Disease Prevention Program, Revision 4, prepared for U.S. Department of Energy – Richland Operations Office (RL) by contractors under contract to Office of River Protection (ORP) and RL.

This plan integrates worker protection requirements for exposures to beryllium into existing CH2M HILL workflow processes and Occupational Safety and Health programs and procedures, as defined in [RPP-MP-003](#). Specific implementing procedures, which flow down from RPP-MP-003, are contained in the ESH&Q procedure manual. Examples of these implementing procedures include: respiratory protection, hazard communication, work control, job hazard analysis, etc.

This plan also addresses medical surveillance and other provisions that provide early detection of beryllium-related disease for the current TFC and subcontractor employees who may have been exposed to beryllium when working at U.S. Department of Energy sites.

This document provides the basis and requirements for safe removal of beryllium alloy tools, and [TFC-ESHQ-IH-STD-11](#) provides the implementing mechanisms to prohibit the purchase, use, or storage of beryllium-containing material.

1.2 Scope

This plan and specific provisions of 10 CFR 850 apply to facilities, operations, or activities controlled by CH2M HILL as the operating DOE contractor of the Hanford tank farms involving present or past exposure, or the potential for exposure, to beryllium. This program also applies to any current CH2M HILL employee who has previously been exposed to beryllium while working at a U. S. Department of Energy facility or currently has the potential for exposure.

NOTE: CH2M HILL does not currently conduct or manage beryllium operations; however, this program describes existing procedures/processes to address changes in facility conditions, work scope, or newly identified beryllium hazards that would require implementation of beryllium control measures.

10 CFR 850 does not apply to 1) beryllium articles; or 2) laboratory operations within the scope of OSHA 29 CFR 1910.1450, “Occupational Exposure to Hazardous Chemicals in Laboratories.” However, the TFC is effectively managing any possible exposure potential through the elimination of beryllium-containing tools and prohibits the use of beryllium tools by contractors and lower-tier subcontractors performing work at TFC. The beryllium-containing tool prohibition has been incorporated in all applicable contracts.

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2.0 PROCESS

2.1 Program Review and Approval

This plan, and the Hanford Site Chronic Beryllium Disease Prevention Program, meets the contractor requirements for a Chronic Beryllium Disease Prevention Program specified in 10 CFR 850. It will be submitted to DOE for review and approval, as necessary. Any significant changes resulting from the performed annual review of the program must also be submitted to DOE for review and approval.

Notification of program review, revision, and implementation is provided in accordance with company requirements for procedure/program development and review as specified in [TFC-BSM-AD-C-01](#).

3.0 RESPONSIBILITIES

3.1 Safety and Health Program

- Develops and maintains this plan, including the annual review and revision process.
- Assigns a beryllium program coordinator to:
 - Develops and forwards updated to the Beryllium Current Facilities List maintained by Fluor Hanford.
 - Serves as the CH2M HILL interpretive authority for beryllium.
 - Assists managers in the completion of Employee Job Task Analyses (EJTAs) in accordance with [TFC-ESHQ-S IH-C-17](#).
 - Interfaces with other Hanford Site prime contractors to share expertise and lessons learned, and to promote site-wide integration of beryllium protective measures, where appropriate.
 - Provides the site occupational medical director applicable exposure monitoring data, hazard assessment results, and a list of beryllium associated workers who may be eligible for protective measures.
 - Ensures the CH2M HILL beryllium program is updated and requirements are integrated into existing programs and procedures for safety and work planning (e.g., Job Hazards Analysis procedure). The integration process will follow the requirements in the Technical Procedure Control and Use procedure ([TFC-OPS-OPER-C-13](#)), or equivalent procedure.
 - Communicates the CH2M HILL beryllium program and requirement updates to both management and workers when newly identified hazard information or changes in facility conditions, operations, or work scope present a potential source of beryllium exposure.
 - Participates in the process to update the Hanford Site Chronic Beryllium Disease Prevention Program when newly identified hazard information or changes in

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facility conditions, operations, or work scope present a potential source of beryllium exposure.

- Provides and coordinates case management support, including the assignment of a beryllium employee health advocate.
- Maintains company records in accordance with confidentiality requirements and records management protocol.
- Conducts specialty assessments on programmatic elements and field implementation of the TFC beryllium program.
- Supports the Procurement and Materials Management organization in the event subcontractor work scope may involve beryllium activities.
- Integrate budget planning to address medical provisions for beryllium associated workers.
- Interfaces with ORP and RL.

3.2 Field Safety and Health

- Identifies and recommends engineering controls, work practices, personal protective equipment, and required training to reduce or eliminate exposures to beryllium hazards.
- Develops and implements sampling plans.
- Reports sample results and notifies employees of exposure in accordance with 10 CFR 850.

3.3 Line Management

Project Delivery is responsible for:

- Maintaining the beryllium tool control initiative described in Section 4.3.1.
- Controlling beryllium hazards by acting upon safety and health program recommendations.
- Implementing recommendations of the site occupational medical contractor for medical surveillance of beryllium-assigned workers, including beryllium medical recommendations, beryllium work restrictions, and beryllium medical removal.
- Supporting case management for employees identified by the Safety and Health Program.

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3.4 Beryllium Employee Health Advocate

The Safety and Health Program has assigned a beryllium health advocate whose primary duties include:

- Assisting beryllium-affected workers in obtaining services through the site occupational medical contractor and other private care providers. For the purposes of this document, CH2M HILL will classify an employee as a “beryllium-affected worker” if the employee has been diagnosed with beryllium sensitization or chronic beryllium disease.
- Assisting beryllium-affected workers in arranging additional medical testing to support beryllium medical surveillance requirements, including travel for worker and a traveling companion, lodging and transport arrangements, and actual testing.
- Supporting activities directed to informing the work force of the site’s historical use of beryllium and the facilities in which beryllium exposure could have occurred.
- Obtaining information and guidance for workers with regard to Washington State Labor and Industry’s Workers’ Compensation policies and practices.
- Supporting beryllium-affected workers in interfacing with their management and others, such as the site occupational medical contractor and private health care providers, with regard to symptoms of chronic beryllium disease.
- Participating in the budget planning process to address employers’ responsibilities for beryllium-affected workers.
- Informing management of concerns and special needs that face beryllium-affected workers.
- Serving as the CH2M HILL representative to the beryllium awareness group.

3.5 Environmental Program

Determines and approves waste disposal options to ensure compliance with state, federal, and local regulations for beryllium wastes.

3.6 Human Development and Communications

Implements medical removal recommendations from the site occupational medical contractor on beryllium-assigned workers relative to applicable provisions of 10 CFR 850.35. Section 4.11 describes the elements of the medical removal program.

4.0 PROGRAM ELEMENTS

(7.1.1)

In accordance with 10 CFR 850, employers are required to develop a beryllium program that addresses all work with the potential to expose employees to beryllium above the action level. The detail, scope, and content of the beryllium program shall be commensurate with the hazards of the activities performed. This section describes the elements of the program.

4.1 Baseline Beryllium Inventory

(7.1.2)

An initial baseline beryllium inventory and hazard assessment was conducted for the Hanford Site. The initial baseline inventory was developed based on review of current and historical records, employee interviews, documentation of the characteristics and locations of beryllium at the facility, and results of air monitoring, surface, and bulk sampling. Results are contained in the Initial Beryllium Characterization Report, dated September 29, 1999, (memo number [FDH-9957106](#)) and include references to the following TFC facilities: four tool cribs, 272-WA (tool crib), 2101-HV (tool crib), 2703-E (tool crib), and 272-AW (tool crib), and the 241-A (waste tanks). These facilities are currently listed on the [Beryllium Current Facilities List](#). Results of air monitoring conducted as part of the baseline inventory and initial hazard assessment of the tool cribs showed airborne concentrations less than the action level defined in 10 CFR 850. The air monitoring results were below a minimum detectable limit of $0.02 \text{ } \Phi\text{g}/\text{m}^3$.

The Safety and Health Program has assigned a qualified individual, the beryllium program coordinator, to submit requests to update the Beryllium Current Facilities List on the HLAN.

The beryllium program coordinator will:

- Be a senior industrial hygienist with appropriate experience who reports directly to a senior member of management
- Be either certified in the practice of industrial hygiene by the American Board of Industrial Hygiene or meet the ABIH requirements for certification
- Have a college or university degree in industrial hygiene or a related scientific, engineering, or technical degree, special studies and training, and five years of full-time employment in the professional practice of industrial hygiene.

4.2 Hazard Assessment

If work scope, facility status, or operational changes result in the potential for beryllium exposures to changes from the initial hazard assessment, a new hazards assessment shall be conducted by the Safety and Health Program Industrial Hygiene staff. The hazard assessment shall include an analysis of existing conditions, exposure data, medical surveillance trends, and exposure potential of planned activities. Areas in facilities which have the potential for current beryllium exposure based on past beryllium work shall be treated as a precaution as a potential beryllium contamination area until beryllium surface sampling has been performed with a detection limit of $0.2 \text{ } \Phi\text{g}/100 \text{ cm}^2$. Controls for protecting workers will be documented in accordance with [TFC-ESHQ-S SAF-C-02](#).

4.2.1 Exposure Limits

The DOE-established exposure limits for airborne beryllium include a permissible exposure limit of 2.0 micrograms per cubic meter ($2.0 \text{ } \Phi\text{g}/\text{m}^3$) as an 8-hour time-weighted average (TWA) in the worker's breathing zone.

4.2.2 Action Levels

The established DOE action level is defined as an airborne concentration of beryllium no greater than 0.2 microgram per cubic meter $0.2 \text{ } \mu\text{g}/\text{m}^3$ 8-hour TWA. If airborne concentration of beryllium is at or above the established action level, the following provisions must be implemented in accordance with 10 CFR 850: periodic monitoring, establishment of regulated areas, availability of change rooms, protective clothing and equipment, and medical surveillance.

4.2.3 Exposure Monitoring

1. Working with the CH2M HILL beryllium health advocate, an industrial hygienist will meet with each beryllium-affected worker to discuss his or her current potential for beryllium exposure, and the need, if any, to conduct personal air space monitoring and surface sampling of areas around their normal work space.
2. Exposure monitoring shall be conducted in accordance with 10 CFR 850; the applicable National Institute for Occupational Safety and Health sampling method; and company level procedures contained in the industrial hygiene personal monitoring program plan contained in [TFC-PLN-34](#) and the ESH&Q procedures manual.
3. Initial monitoring has been conducted in areas identified on the baseline inventory to characterize any potential beryllium hazard.
4. Additional periodic monitoring will be conducted in accordance with a monitoring plan developed by the Safety and Health Program as follows:
 - Whenever a potential beryllium hazard is identified
 - If operations or procedures change, which would introduce a potential beryllium hazard; and then periodically thereafter to determine the effectiveness of control measures.

NOTE: At least on a quarterly basis personal exposure monitoring is required for all workers who work in areas where airborne concentrations of beryllium are at or above $0.2 \text{ } \mu\text{g}/\text{m}^3$ 8-hour TWA.

5. CH2M HILL will notify affected employees of monitoring results in writing within ten days after the receipt of those results. When the action level has been exceeded, the employee will receive a statement describing the measured level and actions taken to reduce worker exposure below the action level. CH2M HILL will make an initial call to the ORP facility representative within one working day of receipt of results and follow up with formal written notification to ORP and the site occupational medical director within ten working days of the receipt of monitoring results whenever results are at or exceed the action level.
6. Exposure monitoring results will be considered when completing an EJTA to ensure enrollment in the appropriate medical monitoring program.

4.3 Exposure Reduction and Minimization

4.3.1 Beryllium Tool Removal Rationale

Beryllium alloy tools used to resist sparking were replaced with a suitable substitute, and use of beryllium alloy tools has been discontinued. Tool removal and disposal will be in accordance with the specific Job Hazard Analysis (JHA) that has been developed for the proper handling and safe removal of beryllium tools. The JHA requires airborne monitoring and wipe sampling while beryllium alloy tools are being removed, and specifies the appropriate protective measures to assure containment, control employee exposure, and proper disposal of waste. Initial beryllium tool removal activities were completed in February 2001. [Attachment A](#) describes the basis used for the identification and removal of beryllium tools.

4.3.2 Tank Waste

Low levels of beryllium may potentially be present in the liquid tank wastes stored in underground tanks. Radiological controls to protect workers from potential exposure to radiological materials and toxic gasses and/or vapors are adequate to protect workers from potential beryllium exposures. Similarly, potential exposure to beryllium in the 242-A Evaporator building is unlikely due to radiological controls.

4.3.3 Beryllium-Controlled Areas

Beryllium-controlled areas will be established within a facility where beryllium surface contamination levels are known to exceed 0.2 microgram per 100 square centimeters ($0.2\Phi\text{g}/100\text{ cm}^2$) and an evaluation has been performed indicating that airborne beryllium exposures are possible during routine work in the area. These areas will be posted to indicate the presence of beryllium. Access to beryllium-controlled areas will be controlled. Only beryllium-assigned workers will have access to controlled areas where exposures are expected to be equal to or greater than $0.01\text{ ug}/\text{m}^3$. Specific job requirements for controlled areas will be identified in JHAs prepared for that job.

Currently, CH2M HILL does not have work scope that would require beryllium-controlled areas where it is using or processing beryllium or materials containing beryllium. Historically, beryllium use in the tank farms was limited to the use of non-sparking beryllium alloy tools. These non-sparking beryllium alloy tools were recently replaced with a suitable substitute and use of beryllium-alloy tools in the tank farms has been prohibited.

Low levels of beryllium may potentially be present in the liquid tank wastes stored in underground tanks. Existing radiological controls to protect workers from potential exposures to radiological materials and toxic gasses and/or vapors are adequate to protect workers from potential beryllium exposures.

Evaluations will be performed when activities are identified that may cause airborne beryllium exposures (e.g., facility modifications and decontamination).

4.3.4 Beryllium-Regulated Areas

Beryllium-regulated areas will be established whenever airborne concentrations of beryllium meet or exceed the action level. Regulated areas require the establishment of marked boundaries, limiting worker access to authorized personnel, maintenance of entry logs into the areas, change

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rooms, provisions for protective clothing, personal protective equipment, and appropriate labeling and laundering of protective clothing. Specific job requirements for regulated areas will be identified in JHAs prepared for that job.

Currently, CH2M HILL has no facilities or operations that meet the criteria to establish beryllium-regulated areas.

4.3.5 Warning Signs and Labels

Signs will be posted at entrances to regulated areas that are established when action levels are reached. Warning labels are required for containers of beryllium, beryllium compounds, or beryllium contaminated clothing, equipment, scrap, or debris.

Currently, CH2M HILL does not have facilities or operations requiring the establishment of regulated areas for control of beryllium.

Hanford has chosen to post areas that have a current potential for beryllium exposure. To ensure consistency across the Hanford Site, a standard format has been developed for beryllium signs for these facilities. The sign is black and yellow, with the wording as shown below. The area covered by the posting will depend on the size of the area of potential contamination and could include the entire facility. The posting will indicate the area of contamination, whether the contamination is known or potential, and a person to contact for additional information on beryllium sampling results for the area (if the results are not posted at the facility). In addition, if the area is locked, the person to contact for access will be posted.

NOTE: Posting results or summaries are a recommended method of communicating the information to all workers.

4.4 Hygiene Facilities and Practices

This section applies only to regulated areas where established exposure monitoring results are at or above the action level. CH2M HILL has no operations, facilities, or areas where workers are exposed to beryllium at or above the action level.

The JHA developed for the removal of beryllium tools prohibits food or beverage use, cosmetic application, or leaving work areas with potentially contaminated protective clothing.

4.5 Respiratory Protection

CH2M HILL has a fully implemented respiratory protection program that complies with 29 CFR 1910.134 and is implemented in [TFC-ESHQ-S IH-C-05](#).

Potential Beryllium Contamination Area Posting**CAUTION - POTENTIAL BERYLLIUM CONTAMINATION**

_____ contain(s) **POTENTIAL** beryllium contamination.

Contact _____ for sampling results and specific locations where beryllium contamination may exist. No work should be performed in these areas without evaluating the potential for beryllium exposure.

Known Beryllium Contamination Area – Airborne Beryllium Exposure Unlikely Posting**CAUTION – KNOWN BERYLLIUM CONTAMINATION – AIRBORNE BERYLLIUM EXPOSURE UNLIKELY**

contain(s) **KNOWN** beryllium contamination. An evaluation of the potential for airborne exposure has been performed and indicates that such exposure is unlikely during normal work operations around these materials. If work is planned that involves dust-disturbing activities directly on these materials (such as grinding, sanding, welding, etc.), the potential for airborne beryllium exposure should be reevaluated prior to performing the work. Additional information on the sampling and evaluation results can be obtained as indicated below.

Known Beryllium Contamination Area – Beryllium Controlled Area Posting**CAUTION – KNOWN BERYLLIUM CONTAMINATION – BERYLLIUM CONTROLLED AREA**

contain(s) **KNOWN** beryllium contamination and have been designated as **BERYLLIUM CONTROLLED AREAS**. These areas are currently locked. If access is needed into these areas, or additional information is desired on sampling results, they can be obtained as indicated below.

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4.6 Housekeeping

CH2M HILL has conducted initial and periodic surface wipe samples to determine surface contamination levels of beryllium tools and the tool crib storage area. Results of wipe sampling conducted since 1998 are below a minimum detection limit of 0.5 $\Phi\text{g}/100\text{ cm}^2$.

NOTE: Wipe sampling conducted June 6-9, 2003, has recently been completed and is being analyzed with a minimum detection level of 0.2 $\Phi\text{g}/100\text{ cm}^2$. The criteria DOE set for removable surface contamination during non-operational periods is 3 $\Phi\text{g}/100\text{ cm}^2$ as specified in 10 CFR 850.30.

4.7 Waste Disposal

Beryllium tools will be disposed of in accordance with state and local laws and requirements, and as specified by the Environmental Health Program organization.

Any waste generated through cleaning of beryllium-contaminated surfaces and tool removal activities will be managed in accordance with state and local laws and requirements, and as specified by the Environmental Health Program organization. Containers will be clearly marked to identify their beryllium-related content.

4.8 Release Criteria

All beryllium-contaminated equipment will be cleaned and wipe sampled before release. Any release of contaminated equipment shall be in accordance with 10 CFR 850.31 and as required by the Environmental Health Program organization. The criteria DOE set for equipment release is 0.2 $\Phi\text{g}/100\text{ cm}^2$ as specified in 10 CFR 850.31.

4.9 Beryllium Emergencies

CH2M HILL has an on-going emergency response program and the existing emergency response system is prepared to respond to both environmental and medical emergencies.

Based on the current facilities managed by CH2M HILL, the hazard potential from the release of airborne beryllium emergency is negligible. However, the potential hazards of beryllium have been included in the applicable site emergency action plan and the site-specific safety plan in accordance with 29 CFR 1910.120.

4.10 Medical Surveillance

Beryllium medical surveillance at the Hanford Site is provided by the site occupational medical contractor in accordance with [10 CFR 850.34](#). The site occupational medical contractor provides this service under contract to DOE-RL. "The Site Support Plan for Medical Services," prepared by the site occupational medical contractor, is an attachment to the Hanford Site Chronic Beryllium Disease Prevention Plan. The Site Support Plan for Medical Services describes beryllium-related medical services the site occupational medical contractor provides to CH2M HILL and the other prime contractors at Hanford.

CH2M HILL has the responsibility to identify employees to the site occupational medical contractor who are beryllium-associated workers. This includes employees who are currently working with beryllium and those who have had previous exposures, as defined in Section 6.0.

Current beryllium workers are identified through the EJTA process, which is completed upon initial employment and is reviewed annually or whenever hazard profiles change for that employee's tasks. Submittal of the EJTA to the site occupational medical contractor initiates medical surveillance.

CH2M HILL is identifying those company employees with previous exposures who may want to participate in a comprehensive medical surveillance program. Employees can initiate this "self-identification" process by:

- Completing the Hanford Beryllium Employee Questionnaire which is available on HLAN
- Contacting the TFC beryllium health advocate
- Calling the site occupational medical contractor beryllium phone line
- Notifying their supervisor
- Voluntarily completing the DOE Historic Health Exposure Questionnaire.

All CH2M HILL employees will be informed at least annually of this program and the opportunity to self-identify past exposures. CH2M HILL uses numerous avenues to provide this information, such as safety meetings, staff briefings, electronic media, task groups, internal publications, and the annual update of the EJTA.

CH2M HILL will provide a beryllium employee health advocate to assist employees who test positive for beryllium sensitization and/or chronic beryllium disease as described in Section 3.3.

CH2M HILL will refer employees to the site occupational medical contractor for a counseling program that assists workers who are diagnosed by the site occupational medical director to be sensitized to beryllium or to have chronic beryllium disease. This counseling program will include communicating with beryllium-associated workers concerning the medical surveillance program provisions and procedures; medical treatment options; medical, psychological, and career counseling; medical benefits; administrative procedures and workers rights under applicable Workers' Compensation laws and regulations; work practice procedures limiting beryllium-associated worker exposure to beryllium; and the risk of continued beryllium exposure after sensitization.

In accordance with [10 CFR 850.34](#), second and third medical opinions will be provided when a worker does not accept the findings of the site occupational medical contractor. CH2M HILL has assigned a beryllium employee health advocate from the Safety and Health Program organization to assist in obtaining additional medical opinions and to coordinate with the site occupational medical contractor and private physicians. Workers must notify CH2M HILL in writing within ten days of obtaining the disputed medical opinion that they wish to seek a second or third medical opinion.

4.11 Medical Removal

4.11.1 Medical Removal Protection

CH2M HILL will offer a beryllium-assigned worker medical removal from exposure to beryllium if the site occupational medical director determines in a written medical opinion that it is medically appropriate to remove the worker from such exposure. The site occupational medical director's determination must be based on one or more positive Be-LPT results, diagnosis of chronic beryllium disease, an examining physician's recommendation, or any other signs or

symptoms that the site occupational medical director deems medically sufficient to remove a worker.

4.11.2 Temporary Removal Pending Final Medical Determination

CH2M HILL will offer a beryllium-assigned worker temporary medical removal from exposure to beryllium on each occasion that the site occupational medical director determines in a written medical opinion that the worker should be temporarily removed from such exposure pending a final medical determination of whether the worker should be removed permanently. A final medical determination will be the outcome of the multiple physician review process or the alternate medical determination process provided for in paragraphs (c) and (d) of [10 CFR 850.34](#).

When a beryllium-assigned worker is temporarily removed from beryllium exposure pursuant to [10 CFR 850.35](#), CH2M HILL will transfer the worker to a comparable job for which the worker is qualified (or for which the worker can be trained in a short period) and where beryllium exposures are as low as possible, but in no event at or above the action level.

CH2M HILL will maintain the beryllium-assigned worker's total normal earnings, seniority, and other worker rights and benefits as if the worker had not been removed. When there is no such job available, CH2M HILL will provide to the beryllium-assigned worker the medical removal protection benefits specified in paragraph (b)(2) of [10 CFR 850.35](#) until a job becomes available, or for one year, whichever comes first.

4.11.3 Permanent Medical Removal

CH2M HILL will offer a beryllium-assigned worker permanent medical removal from exposure to beryllium if the site occupational medical director determines in a written medical opinion that the worker should be permanently removed from exposure to beryllium. When a beryllium-assigned worker is removed permanently from beryllium exposure based on the site occupational medical director's recommendation pursuant to [10 CFR 850.35](#), CH2M HILL will provide the worker the medical removal protection benefits specified in 10 CFR 850.

4.11.4 Worker Consultation Before Temporary or Permanent Medical Removal

When the site occupational medical director determines that a beryllium-assigned worker should be temporarily or permanently removed from exposure to beryllium, the site occupational medical director must advise the beryllium-assigned worker of the determination that medical removal is necessary to protect the worker's health; provide the beryllium-assigned worker with a copy of 10 CFR 850 and its preamble, and any other information the site occupational medical director deems necessary on the risks of continued exposure to beryllium and the benefits of removal; provide the beryllium-assigned worker the opportunity to have any questions concerning medical removal answered; and obtain the beryllium-assigned worker's signature acknowledging that the worker has been advised to accept medical removal from beryllium exposure as provided in this section, and has been provided with the information specified in this paragraph on the benefits of removal and the risks of continued exposure to beryllium.

4.11.5 Return to Work after Medical Removal

CH2M HILL will not return a beryllium-assigned worker who has been permanently removed to the worker's former job status unless the site occupational medical director first determines in a written medical opinion that continued medical removal is no longer necessary to protect the

worker's health. When the site occupational medical director determines continued exposure to beryllium will not pose an increased risk to the beryllium-assigned worker's health, and medical removal is an inappropriate remedy in the circumstances, the site occupational medical director must fully discuss these matters with the worker and then, in a written determination, may authorize CH2M HILL to return the worker to his or her former job status. Thereafter, the returned beryllium-assigned worker must continue to be provided with medical surveillance under [10 CFR 850.34](#).

4.11.6 Medical Removal Protection Benefits

When a beryllium-assigned worker has been permanently removed from beryllium exposure, CH2M HILL will provide the beryllium-assigned worker the opportunity to transfer to another position which is available, or later becomes available, for which the beryllium-assigned worker is qualified (or for which the worker can be trained in a short period) and where beryllium exposures are as low as possible, but in no event at or above the action level. When the beryllium-assigned worker cannot be transferred to a comparable job where beryllium exposures are below the action level, CH2M HILL will provide a maximum of two years of permanent medical removal protection benefits.

When required by [10 CFR 850.35](#) to provide medical removal protection benefits, CH2M HILL will maintain the removed worker's total normal earnings, seniority, and other worker rights and benefits as though the worker had not been removed.

When a removed beryllium-assigned worker files a claim for workers' compensation payments for a beryllium-related disability, CH2M HILL will continue to provide medical removal protection benefits pending disposition of the claim. CH2M HILL will receive no credit for the workers' compensation payments received by the worker for treatment-related expenses. However, CH2M HILL's obligation to provide medical removal protection benefits to a removed beryllium-assigned worker is reduced to the extent that the worker receives compensation for earnings lost during the period of removal either from a publicly- or employer-funded compensation program or from employment with another employer made possible by virtue of the worker's removal.

For the purposes of [10 CFR 850.35](#), the requirement that CH2M HILL provides medical removal protection benefits is not intended to expand upon, restrict, or change any rights to a specific job classification or position under the terms of an applicable collective bargaining agreement.

CH2M HILL may condition the provision of the medical removal protection benefits upon the beryllium-assigned worker's participation in medical surveillance provided in accordance with [10 CFR 850.34](#).

4.12 Medical Consent

4.12.1 Consent for Medical Evaluations/Examinations

As required by [10 CFR 850.36](#), CH2M HILL will provide each beryllium-associated worker with a summary of the medical surveillance program at least one week before the first medical evaluation or procedure, or at any time requested by the worker. The summary of the medical surveillance program will include the type of data that will be collected in the medical surveillance program, how the data will be collected and maintained, the purpose for which the data will be used, and a description of how confidential data will be protected.

CH2M HILL will also provide each beryllium-associated worker with information on the benefits and risks of the medical tests and examinations available to the worker at least one week prior to any such examination or test, and an opportunity to have the worker's questions answered.

CH2M HILL will require the site occupational medical director to obtain a beryllium-associated worker's signature on the standard informed consent form before performing any medical evaluations or tests.

4.13 Training

All workers will receive beryllium awareness training as provided in Hanford General Employee Training (HGET), course number 358005, or equivalent. Workers conducting decontamination and decommissioning (D&D) or demolition activities involving potential dust exposure in facilities with past or current evidence of beryllium will be treated as beryllium-assigned workers, given beryllium-assigned worker training provided in Fluor Hanford training course number 004100, or equivalent.

4.14 Subcontractor Compliance

CH2M HILL will use existing contract processes and company procedures to administer subcontract requirements for beryllium-related work under the scope of [10 CFR 850](#). Any requests for proposals shall contain requirements for the subcontractor to comply with 10 CFR 850, including the requirement to provide beryllium-assigned workers with the opportunity for medical surveillance, if work is to be conducted in beryllium-controlled or beryllium-regulated areas. The buyer's technical representative has responsibilities for pre-proposal activities, compliance with ISMS and safety requirements, oversight and monitoring of subcontractor performance, and contract close-out activities as specified in [TFC-BSM-CP CPR-C-03](#).

The beryllium program coordinator or a qualified industrial hygienist will provide technical expertise and support to the buyer's technical representative, including review of beryllium-related specifications within the contract, review of subcontractor-submitted safety and health programs/procedures, and review of the flow down of these requirements to lower-tier subcontractors.

A qualified project industrial hygienist will participate in pre-construction meetings for contracts covering work in beryllium-suspect facilities and provide oversight of subcontractor safety performance during work execution through the conduct of field inspections to ensure that work complies with the requirements of 10 CFR 850. Results are provided to the project manager and the contracting buyer's technical representative. The Safety and Health Program organization's responsibilities, in support of the buyer's technical representative, are proceduralized in [TFC-ESHQ-S SAF-C-07](#).

5.0 RECORDS

CH2M HILL will establish and maintain accurate records of all beryllium inventory information, hazard assessments, exposure measurements, exposure controls, and medical surveillance in accordance with [10 CFR 850.39](#) and [10 CFR 850.34\(g\)](#). The Safety and Health Program organization is responsible for maintaining the following beryllium-associated records as part of the company's safety and health program: personal and area exposure monitoring results and

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subsequent notification to employees; surface contamination/wipe sampling results; industrial hygiene equipment calibration and maintenance records; chain-of-custody records and analytical sampling results; hazard assessment records, such as the JHA, baseline inventory, and other hazard assessment documentation; ensuring current EJTA records; and case management records. These records will be maintained in accordance with company procedures to ensure appropriate record access, confidentiality and protection of personal information, and quality requirements.

CH2M HILL will maintain all records that are designated by the heads of DOE departmental elements as agency records and ensure that these record series are retained for a minimum of 75 years. If CH2M HILL ceases to be involved in the Chronic Beryllium Disease Prevention Program, then CH2M HILL will convey to DOE or its delegate all record series required under 10 CFR 850.

CH2M HILL will provide data on work place conditions to the site occupational medical director to link with health outcomes in order to establish a basis for understanding the beryllium health risk.

CH2M HILL will ensure the confidentiality of all work-related records generated under 10 CFR 850 by ensuring that all records transmitted to other parties do not contain names, social security numbers, or any other variables, or combination of variables, that could be used to identify particular individuals; and individual medical information generated by this plan is either included as part of the worker's site medical records and maintained by the site occupational medical director, or is maintained by another physician designated by CH2M HILL; maintained separately from other records; and used or disclosed by CH2M HILL only in conformance with any applicable requirements imposed by the Americans with Disabilities Act, the Privacy Act of 1974, the Freedom of Information Act, and any other applicable law.

CH2M HILL will transmit all records generated, as required by this rule, in a format that protects the confidentiality of individuals to the DOE Assistant Secretary for Environment, Safety and Health upon request.

CH2M HILL, via the site occupational medical contractor, will semiannually transmit to the DOE Office of Epidemiologic Studies within the Office of Environment, Safety and Health, an electronic registry of beryllium-associated workers that protects confidentiality, and the registry must include, but is not limited to, a unique identifier, date of birth, gender, site, job history, medical screening test results, exposure measurements, and results of referrals for specialized medical evaluations.

5.1 Performance Feedback

The Safety and Health Program organization will conduct a specialty assessment of the beryllium program on an annual basis. The specialty assessment shall evaluate program effectiveness to identify and control beryllium exposures, and includes review of exposure monitoring records, medical surveillance activities, occurrence reports, and exposure reduction/minimization efforts. Deficiencies shall be managed in accordance with [TFC-ESHQ-Q C-C-01](#) and entered into the action tracking system, as appropriate. To ensure that information is available to maintain and improve all elements of this plan continuously, CH2M HILL will give results of periodic analyses and assessments to the line managers, planners, worker protection staff, workers, medical staff, and labor organizations representing beryllium-associated workers who request such information.

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5.2 Hanford Site Wide Beryllium Groups

5.2.1 Hanford Beryllium Steering Group

The Hanford Beryllium Steering Group is composed of members from each site prime contractor, the site occupational medical contractor, DOE, and the beryllium awareness group (see below). This group was formed to develop the original Hanford Site Chronic Beryllium Disease Prevention Program. The continuing mission of the group is to discuss beryllium items that affect multiple contractors as well as provide periodic updates to the site Chronic Beryllium Disease Prevention Program.

5.2.2 Hanford Beryllium Awareness Group

The beryllium awareness group is composed of current and former beryllium-affected individuals. The group is supported by DOE, its contractors, and Hanford Atomic Metal Trades Council (HAMTC). The purpose of the group is to provide information and support for current and former beryllium-affected employees and family members; provide input on training and services; be a resource to others on beryllium issues; provide feedback to contractor management and DOE.

The [Group Charter](#) that was current when this plan was approved is subject to periodic reviews and updates by the group

6.0 DEFINITIONS

The following definitions are established by [10 CFR 850.3](#) and are consistent with the Hanford Site Chronic Beryllium Disease Prevention Program.

Action level. Employee exposure level (without regard to the use of respirators) to an airborne concentration of 0.2 microgram per cubic meter ($\Phi\text{g}/\text{m}^3$) as an 8-hour time-weighted average (TWA), above which protective measures outlined in [10 CFR 850.23](#) shall be implemented.

Beryllium. Elemental beryllium and any insoluble beryllium compound or alloy containing 0.1 percent beryllium or greater that may be released as an airborne particulate.

DOE beryllium activity. Refers to an activity taken for, or by, DOE at a DOE facility that can expose worker to airborne beryllium, including but not limited to, design, construction, operation, maintenance, or decommissioning, and which may involve one DOE facility or operation or a combination of facilities or operations.

Beryllium-affected. An individual diagnosed with beryllium sensitization or chronic beryllium disease.

Beryllium article. A manufactured item that is formed to a specific shape or design during manufacture that has end-use functions that depend in whole or in part on its shape or design during end use and that does not release beryllium or otherwise result in exposure to airborne concentrations of beryllium under normal conditions of use.

Beryllium-assigned worker. A current worker who has been assigned by his/her manager to perform work that is anticipated to involve exposure to airborne beryllium at or above $0.01 \Phi\text{g}/\text{m}^3$. Such an exposure is likely to be on an infrequent basis. Their EJTA shall reflect

that the worker is a beryllium-assigned worker. No current beryllium exposure should occur for any employee who is not a beryllium-assigned worker.

Beryllium associated worker. A current employee of the TFC who is (or was) exposed or potentially exposed to airborne concentrations of beryllium at a U. S. Department of Energy facility and may include the following individuals:

- A current CH2M HILL worker whose work history shows that the worker may have been exposed to airborne concentrations of beryllium at a DOE facility (“previous worker”)
- A current CH2M HILL worker who exhibits signs or symptoms of beryllium exposure
- A current CH2M HILL worker who is receiving medical removal protection benefits
- A beryllium-assigned worker.

Beryllium-cleared facility. A facility where beryllium may have been present in the past, but a review of historical records indicate that no operations were performed to generate beryllium particulate (such as grinding, welding or brazing), and where beryllium characterization sampling has demonstrated that all surface beryllium levels are less than $0.2 \text{ } \Phi\text{g}/100 \text{ cm}^2$.

Beryllium-contaminated material. Equipment and/or items that were used in beryllium production work, or discovered to have surface contamination levels greater than $0.2 \text{ } \Phi\text{g}/100 \text{ cm}^2$ or the background level for local soils (dust), whichever is greater.

Beryllium-controlled area. A facility or an area within a facility where beryllium surface contamination levels are known to exceed $0.2 \text{ } \Phi\text{g}/100 \text{ cm}^2$ and an evaluation has been performed indicating that airborne beryllium exposures are possible during routine work in the area. These areas will be posted to indicate the presence of beryllium, and access will be controlled.

Beryllium facilities list. The listing of locations at Hanford where the presence of beryllium has been evaluated. This listing is equivalent to the baseline beryllium inventory required in 10 CFR 850.20.

Beryllium medical recommendation. The site occupational medical director provides a written medical opinion to the TFC (via a permanent medical restriction) recommending that a worker’s future occupational airborne beryllium exposure be kept below an 8-hour TWA of $0.01 \text{ } \Phi\text{g}/\text{m}^3$. As a matter of health and safety policy, the Hanford site occupational medical director has created a new airborne action level for medical restriction/removal purposes that is twenty times more protective than required by the 10 CFR 850 regulations.

Beryllium medical removal. When CH2M HILL receives a beryllium medical recommendation for a beryllium-affected worker, the employee will be offered a beryllium medical removal (in accordance with 10 CFR 850.35) if they are currently working as a beryllium-assigned worker. The designation of these workers will be changed to beryllium: Previous exposure workers and their EJTA updated to reflect this change.

Beryllium regulated area. An area demarcated by CH2M HILL in which the airborne concentration of beryllium exceeds, or can reasonably be expected to exceed, the action level.

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Beryllium work restriction. When CH2M HILL receives a beryllium medical recommendation, a permanent work restriction will be implemented to comply with the recommendation. The purpose of this restriction is to prevent both current and future employee exposure to airborne beryllium and the wording on the work restriction will state that the employee is not to be exposed to airborne beryllium levels which are at or above an 8-hour TWA of $0.01 \text{ } \Phi\text{g}/\text{m}^3$. The restriction will be implemented whether the employee has any potential for beryllium exposure in the current job.

Beryllium worker. A CH2M HILL employee who is exposed or potentially exposed to airborne concentrations of beryllium at or above the action level or acceptable ceiling concentration, or is currently receiving medical removal benefits.

NOTE: For purposes of this document, “current” refers to those CH2M HILL employees who are actively working at Hanford and those who are on disability. Consistent with the Hanford Site Chronic Beryllium Disease Prevention Program, the CH2M HILL beryllium program does **NOT** apply to individuals who no longer work at Hanford.

7.0 SOURCES

7.1 Requirements

1. 10 CFR 850, “Chronic Beryllium Disease Prevention Program.”
2. Letter, FDH-9957106, “Initial Beryllium Characterization Report,” D. L. Renberger to S. J. Veitenheimer, dated September 29, 1999.

7.2 References

1. Hanford Site Chronic Beryllium Disease Prevention Program, Revision 4, June 12, 2003.
2. RPP-MP-003, “Integrated Environment, Safety, and Health Management System Description for the Tank Farm Contractor.”
3. TFC-BSM-AD-C-01, “Administrative Document Development and Maintenance.”
4. TFC-BSM-CP_CPR-C-03, “Buyer’s Technical Representative Process.”
5. TFC-ESHQ-Q_C-C01, “Problem Evaluation Request.”
6. TFC-ESHQ-S_IH-C-05, “Respiratory Protection.”
7. TFC-ESHQ-S_IH-C-17, “Occupational Medical Qualification and Monitoring.”
8. TFC-ESHQ-IH-STD-11, “Carcinogen Control.”
9. TFC-ESHQ-S_SAF-C-07, “Safety, Health, and Radiological Control Subcontractor Oversight.”
10. TFC-PLN-34, “Industrial Hygiene Exposure Assessment Strategy.”

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ATTACHMENT A – BASIS USED FOR IDENTIFICATION AND REMOVAL OF BERYLLIUM TOOLS

CH2M HILL has established an As Low As Reasonably Achievable (ALARA) approach for exposure to airborne beryllium or beryllium-containing products. A review of historic building use data, employee interviews, and operational procedures indicates that beryllium is assumed to be a low level constituent in certain tank wastes, and some “spark-resistant” copper/beryllium alloy tools were stored in four tool cribs.

Copper/beryllium alloy tools were obtained to meet “spark-resistant” tool criteria specified in the safety analysis report. Spark-resistant tool use was one of the safety contingencies to reduce potential ignition of flammable gas. At the time the tools were acquired, beryllium-related health issues were generally limited to inhalation hazards and the tools were considered articles that posed no health threat. Use of spark-resistant tools has reduced considerably as operational changes and configurations have reduced gas accumulation. Maintenance of a large inventory of spark-resistant tools is unnecessary and other suitable spark-resistant tool replacements have been approved by the Flammable Gas Equipment Advisory Board.

The “spark-resistant” copper/beryllium alloy tools in the CH2M HILL inventory were identified using one or more of the following methods: reviewing past procurement records, reviewing operational tool criteria, or a visual inspection of the “spark-resistant” tools. The “spark resistant” copper/beryllium tools in the CH2M HILL inventory are stamped with a BeCu symbol. The potential risk of an unauthorized tool modification by an employee, i.e., grinding, sharpening, and reshaping copper/beryllium alloy tools, was recognized and the decision was made to eliminate the tools.

The beryllium/copper alloy tools were stored in four separate tool cribs that are tended by tool crib operators. They include: hammers, pliers, screwdrivers, ratchets, sockets, wedges, wrenches, and scrapers. An inventory was conducted in June of 1999 that identified 98 tools at the 2703-E tool crib, 320 tools at the 2101-HV tool crib, 305 tools at the 272-AW tool crib, and 220 tools at the 272-WA tool crib. Potential exposure concerns were expressed by tool crib operators while storing, handling, and issuing beryllium alloy tools. Results of personal breathing zone and area monitoring are below detectable limits. Despite these results, employees are still concerned about skin sensitization and the possibility that tools may be altered by grinding or other method. To ensure the safety of all CH2M HILL employees and address employee concerns, beryllium tool removal and replacement actions were initiated.

Tool removal was performed in accordance with worker protection measures identified in a Job Hazard Analysis developed specifically for beryllium tool removal. The tools will be disposed of as waste in accordance with all applicable state and local requirements as specified by Environmental Health. Results of personal and area monitoring conducted during previous beryllium tool removal activities have been below detectable levels.

Low levels of beryllium may be present in the liquid wastes stored in underground tanks. Radiological controls to protect workers from potential exposures to radiological materials and toxic gasses and/or vapors are adequate to protect workers from beryllium exposures. Similarly, exposure to beryllium in the 242-A Evaporator building is unlikely due to radiological controls.